

# Aviation Safety Program

## Technical Accomplishment

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### Satellite Broadcast Datalink Development & Commercialization for In-flight Weather Information

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**Relevant Milestone:** WxAP Level III MS #9 "Initial Evaluation Transport & GA SATCOM Datalink Flights"

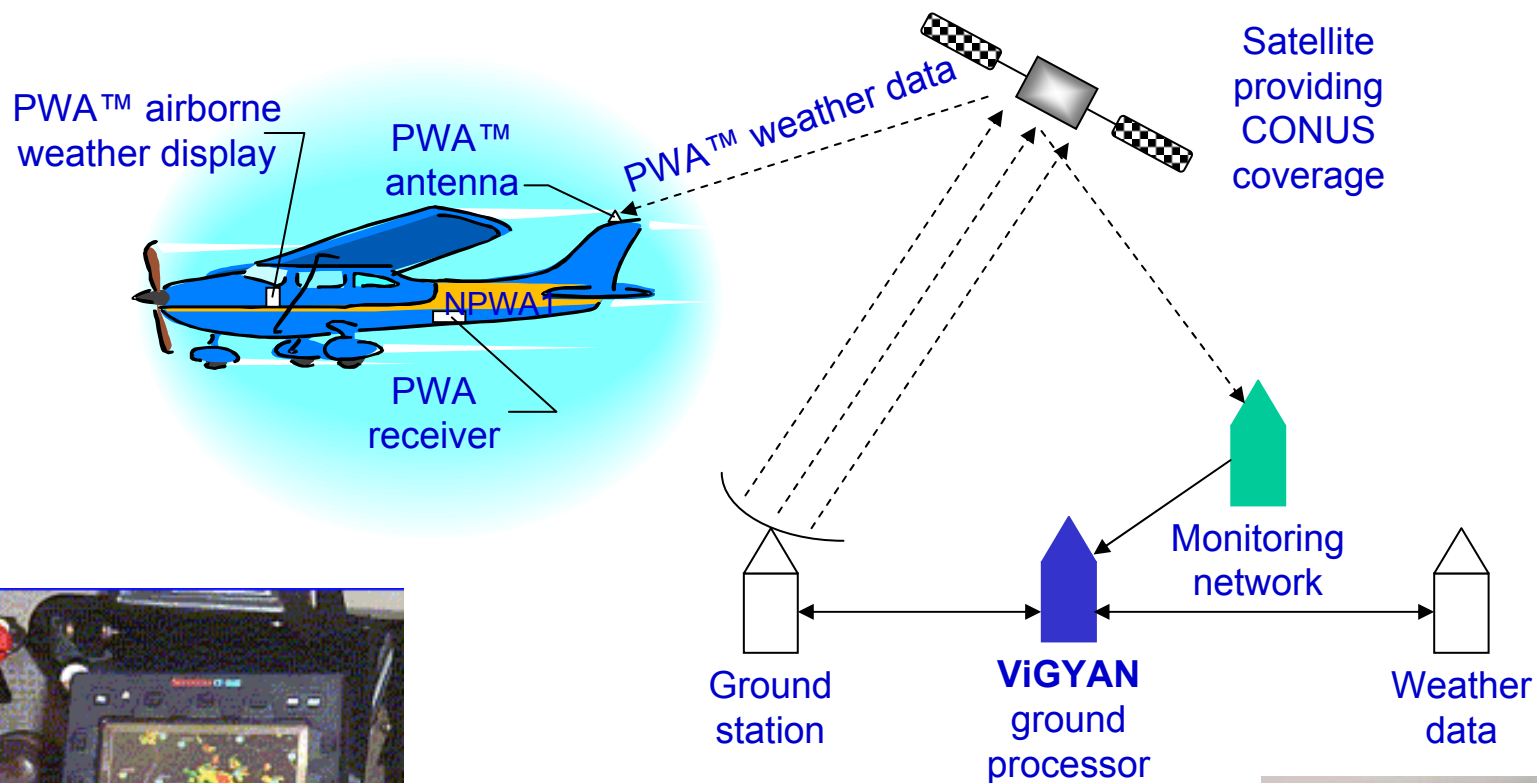
**Shown:** Commercial viability of a satellite broadcast weather information service for general aviation.

**Accomplishment:** There is a critical need for improved dissemination of graphical weather information to the General Aviation cockpit for weather accident prevention. This information needs to be delivered in a timely manner with comprehensive coverage (at all altitudes and across the US). As a result of a NASA Glenn Phase III Small Business Innovative Research (SBIR) contract with ViGYAN Inc., the Pilot Weather Advisor™ (PWA) product is being commercialized. A prototype PWA system was originally developed and patented by ViGYAN under Phase I and II SBIRs sponsored by NASA Langley. Under the Phase III SBIR, a satellite digital data modulator and ground station and the corresponding aircraft receiver/demodulator were designed. The data link uses advanced turbo-coding techniques that enable a signal to be received reliably with less signal power than was previously possible. Every five minutes, a composite mosaic next generation radar (NEXRAD) image for the entire US is updated and broadcast via a commercial geosynchronous satellite. The image is at approximately a 1 nautical mile resolution. A number of these images can be stored and animated to show weather trends. The system also sends other graphical and textual weather information (observations, forecasts and warnings). All products are from a certified aviation weather information provider and conform to the RTCA Flight Information Services-Broadcast (FIS-B) standards. The PWA system consists of an aircraft antenna, a digital data receiver, and a third party display. The receiver is designed to be compatible with a variety of portable and panel mounted displays for maximum marketability. The receiver and antenna are expected to receive FAA certification mid-2002 and commercial service is expected shortly thereafter. A new company, WeatherStream, has been formed to market and maintain this commercial service. The satellite signal will be available across the entire continental US (CONUS) from ground level to 40,000+ feet.

**Future Plans:** Continue development of SATCOM datalink technologies for both GA and transport applications addressing reduced datalink costs and higher data rates. Initial evaluation in FY03 and final demo in FY05.

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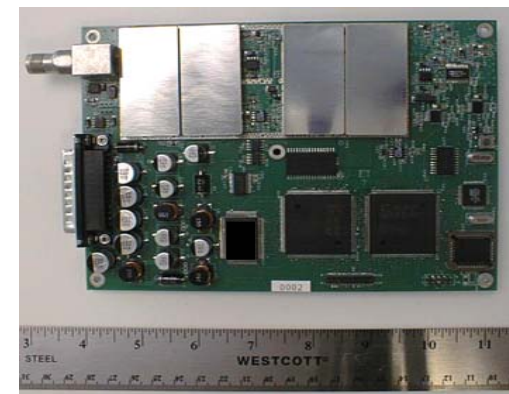
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Portable Cockpit Display



Aircraft Antenna



Receiver Circuit Board